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Bovine colostrum with hyperimmunity against clostridia

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Objective

To investigate the activity of hyperimmune bovine colostrum against *C. perfringens*.

Background

Clostridium spp. are associated with gastrointestinal diseases in infants and adults, of which *C. perfringens* is associated with necrotizing enterocolitis in preterm infants and pigs. Colostrum is the first milk produced after birth and is rich in bioactive compounds. Earlier studies in preterm pigs suggest that bovine colostrum reduces the risk and severity of necrotizing enterocolitis. To increase the effect and specificity of colostrum towards *C. perfringens,* hyperimmune colostrum with increased amount of antibodies towards *C. perfringens* could be produced.

Results

These very preliminary results showed that H-COLOS had increased activity towards *C. perfringens* (Figure 1) indicated by bands with increased intensity compared with COLOS.

No clear difference in band intensity or number of bands were observed towards *C. difficile*, *E. coli* and *L. sakei* (data not shown).

Experimental design (Figure 1)

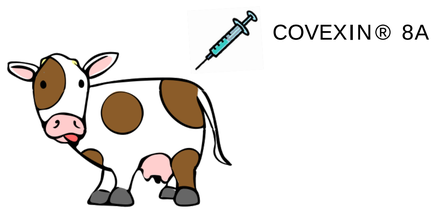
Hyperimmune colostrum (H-COLOS) was prepared by immunizing pregnant cows with a clostridial vaccine (COVEXIN® 8A, Pfizer) 4 times 14 days apart beginning 60 days before expected calving. Colostrum was collected at the first milking and compared with colostrum from non-immunized cows (COLOS).

Immunoreactivity in the hyperimmune colostrum was determined with Western Blot, using antigens extracted from *C. perfringens* NCTC 10240, *C. difficile* O27, *E. coli* ATCC 25922 and *L. sakei* DMS 20017.

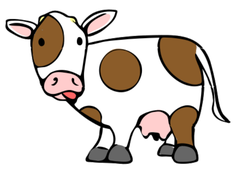
Conclusion

We were able to produce hyperimmune colostrum towards *C. perfringens*, which could serve as a dietary supplement for preterm neonates during the first weeks after birth to protect against *C. perfringens*.

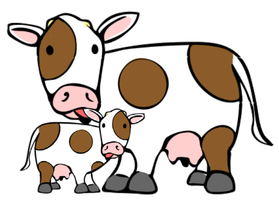
Production of hyperimmune colostrum



Immunized pregnant cows (**H-COLOS,** n = 5)

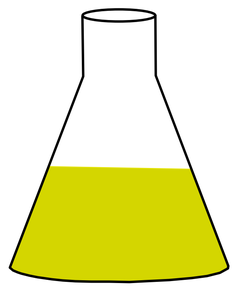


Non-immunized pregnant cows (**COLOS,** n = 5)



Colostrum collected at the first milking

Extraction of antigens from *C. perfringens*



1. Overnight culture of *C. perfringens* in BHI broth
2. Harvest cells by centrifugation
3. Wash 3 times in PBS
4. Resuspend pellet in disodium phosphate buffer
5. Sonicate on ice

Western Blot (Results)

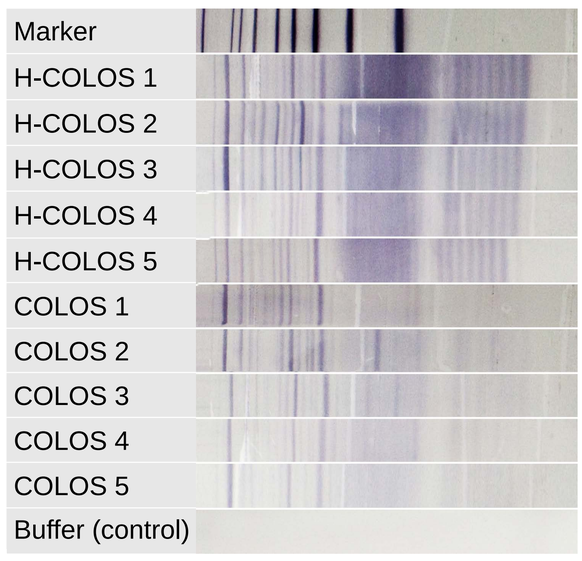


Figure 1: Experimental design and results